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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/771,982	02/03/2004	Kwang-Il Kim	9898-340	3579

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EXAMINER	
KOCH, GEORGE R	

ART UNIT	PAPER NUMBER
1734	

DATE MAILED: 08/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/771,982	KIM, KWANG-IL	
	Examiner	Art Unit	
	George R. Koch III	1734	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☒ Claim(s) *11-13* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *2/3/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not). Applicant numbers claims 1-10 and 14-17 properly. There are two claim 11's, one claim 12 and no claim 13.

Misnumbered claim 11 (second instance) been renumbered 12.

Misnumbered claim 12 been renumbered 13.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claim 1, 2 and 4-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Liang (US Patent 6,245,148 B1).

Liang discloses a apparatus capable of supplying photoresist comprising: a bottle (item 11) capable of containing a photoresist, a trap tank (item 30) capable of storing the photoresist supplied from the bottle via a first supply line capable of supplying photoresist (represent by the pathway with Valve V3); a lower sensor and an upper sensor (Sensors Sb3, Sb2, and Sb1) respectively installed near a bottom and a top of the trap tank to detect the liquid (which can be photoresist) in the trap tank; a drain line connected to an upper side of the trap tank to release air (represented by the pathway with Valve V4); a blocking valve installed at the drain line (item V4), the blocking valve structured to be opened to release air or closed to prevent a liquid (which can be photresist) loss according to signals detected by the lower sensor and the upper sensor (as described in column 3, line 60 to column 4, line 37); and a pump (item 60) capable of dispensing photoresist onto a wafer, the liquid supplied through a second supply line (represented by the line with valve V7) connected to a lower side of the trap tank.

As to claim 2, Liang discloses numerous valves (V7, V1 and V2) along the second supply line connected to the lower side of the trap tank which are capable of being closed for a bottle change operation.

As to claims 4-8, the apparatus of Liang is capable of opening and closing the photoresist blocking valve (item V4) in the claimed manner based on the claimed sensor readings.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Liang as applied to claim 1 above, and further in view of Raphael (US Patent 5,383,574)

Liang as applied to claim 1 discloses all of the limitations of claim 1.

As to claim 3, Liang discloses a nitrogen line is connected to the supply bottle (column 3, lines 1-4). Liang discloses that the nitrogen is supplied into the bottle to pressurize the liquid in the liquid bottle.

Liang is silent as to a button valve installed at the nitrogen supply line to control nitrogen supply.

Raphael discloses that it is known to use an opening/closing valve (items 105 and 150) which is installed at the nitrogen supply line to control nitrogen supply. This valve is functionally equivalent to the claimed button valve, and one in the art would use either as a design choice. One in the art would appreciate that such valves enable the

liquid supply to be pressurized and dispensed properly. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized such valves in order to enable the liquid supply to be pressurized and dispensed properly.

7. Claims 9-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sekiguchi (US 2002/0050247 A1) in view of Liang (US 6,245,148 B1).

Sekiguchi discloses (for all reference numerals, see Figure 4) a photoresist supply apparatus (see paragraph 0002, which discloses resist as a supply material) comprising a first photoresist bottle (item 4, on the right) for containing a first photoresist, a first trap tank (item 3 on the right) for storing the first photoresist supplied from the first photoresist bottle via a first photoresist supply line (item 6 on the right); a first drain line connected to an upper side of the first trap tank to release air (item 11 on the right); a first photoresist-blocking valve (lower item 13) installed at the first drain line, the first photoresist-blocking valve structured to be opened to release air or being closed to prevent photoresist loss according to signals sent by a controller (item 16), a second photoresist bottle (item 4 on the left) for containing a second photoresist; a second trap tank (item 3 on the left) for storng the second photoresist supplied from the second photoresist bottle via a third photoresist supply line (item 6 on the left); a second drain line (item 11 on the left) connected to an upper side of the second trap tank to release air; a second photoresist-blocking valve (upper item 13) installed at the second drain line, the second photoresist-blocking valve structured to be opened to release air or being closed to prevent photoresist loss according the signals from the control

system (item 16); and a photoresist pump (items 25 and 40) for dispensing, onto a wafer, one of the first photoresist and the second photoresist supplied through a second photoresist supply line (the pipe between the right tank 3 and right valve 8) and a fourth photoresist supply line (the pipe between the left tank 3 and left valve 8) connected to a lower side of the first trap tank and a lower side of the second traptank, respectively.

Sekiguchi does not disclose that each trap tank has lower and upper photoresist sensors. Sekiguchi merely uses a single photoresist sensor for supplying the signals to control system, which then controls the photoresist blocking valves and other valve structures.

Liang discloses that it is known to use both lower and upper photoresist sensors (items Sb1 and Sb3) for controlling the operations of the system. Liang discloses (column 3, lines 1-21) that adding an upper and lower sensor allows for more control of the volume of the material in the tank, such as an alert to excessive material. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized such the multiple sensors arrangement of Liang in lieu of the single trap tank sensor of Sekiguchi in both trap tanks of Sekiguchi in order to achieve better control of the volume of material in the tank.

As to claim 10, Sekiguchi discloses valves (right and left valves 8) which function as bottle changed valves as claimed.

As to claims 11-16, the apparatus of Sekiguchi, as modified by Liang is capable of opening and closing the photoresist blocking valve (items 13 in Sekiguchi, which is

analgous item V4 in Liang) in the claimed manner based on the claimed sensor readings.

8. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sekiguchi and Liang as applied to claim 9 above, and further in view of Raphael (US Patent 5,383,574)

Sekiguchi and Liang as applied to claim 9 discloses all of the limitations of claim 9.

As to claim 17, Sekiguchi discloses a nitrogen line is connected to the supply bottle (item 5). Liang discloses that the nitrogen is supplied into the bottle to pressurize the liquid in the liquid bottle, which enables better dispensing of the liquid. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have

Liang is silent as to a button valve installed at the nitrogen supply line to control nitrogen supply.

Raphael discloses that it is known to use an opening/closing valve (items 105 and 150) which is installed at the nitrogen supply line to control nitrogen supply. This valve is functionally equivalent to the claimed button valve, and one in the art would use either as a design choice. One in the art would appreciate that such valves enable the liquid supply to be pressurized and dispensed properly. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized such valves in order to enable the liquid supply to be pressurized and dispensed properly.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to George R. Koch III whose telephone number is (571) 272-1230 (TDD only). If the applicant cannot make a direct TDD-to-TDD call, the applicant can communicate by calling the Federal Relay Service at 1-866-377-8642 and giving the operator the above TDD number. The examiner can normally be reached on M-Th 10-7.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher Fiorilla can be reached on (571) 272-1187. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

George R. Koch III
Patent Examiner
Art Unit 1734

GRK
August 22nd, 2004